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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,786	08/01/2001	Brian Vosburgh	OR02-13701	5157

7590 03/09/2005

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EXAMINER

VO, TED T

ART UNIT	PAPER NUMBER
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2122

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,786

Applicant(s)

VOSBURGH, BRIAN

Examiner

Ted T. Vo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-16,18-31 and 33-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-16,18-31 and 33-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This action is in response to the amendment filed in Request for Continued Examination on 12/02/2004 to the Claims filed on 09/10/2004.

Claims 1, 16, 31, 47, 56-61 are amended.

Claims 2, 17, and 32 are canceled.

Claims 1, 3-16, 18-31, 33-61 remain pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 16, 31, 47, and 56-61 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A person shall be entitled to a patent unless –

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-16, 18-31, 33-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rundensteiner et al, "Maintaining Data Warehouses Over Changing Information Sources", in view of Henninger (US Pat. No. 5,499,371).

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Given the broadest reasonable interpretation of followed claims in light of the specification.

As per claim 1:

Rundensteiner teaches maintaining data warehouses over changing information sources, where the term 'data warehouses' relates to relational or object oriented database system, and the term 'changing information sources' relates to XML documents.

Rundensteiner teaches translations between the native model of the sources (*XML document data*) and the data model of the data warehousing system (*object model*) by the means of wrappers (*mapping*). A specific translation is shown in figure 3 (page 60) by building the relational wrappers over XML datasets and mapping XML document type definitions into relational metadata (see page 3, left-hand column, section "Heterogeneous model information sources"). Thus relational metadata describes a relational model context (object model) as shown in Figure 3, and shows how data under type definitions of an XML document is laid out. The relational model context represents a schema/object model in the warehousing system.

Thus, Rundensteiner discloses,

"A method for mapping (See Figure 1, page 58, 'Wrapper') data in a markup language document (See Figure 1, 'XML', and see right-hand column (page 58), section "Data Warehousing Architecture", referring to line 9 of second paragraph, 'The native model of the source' (i.e. XML documents)) to an object model (See Figure 1, the relational 'RBBMS', and see right-hand column (page 58), in section "Data Warehousing Architecture": refer 'relational or object-oriented database systems' in lines 8-9 of first paragraph, and refer 'common model of the data warehouse system' in lines 9-10 of second paragraph or 'schema' in line 11 of second paragraph for the limitation 'object model'), the method comprising the steps of:

receiving a mapping request for mapping data in a markup language document having data architecture into an object model (see page 58, right-hand column, section: "Data Warehousing Architecture", lines 12-13 of second paragraph, refer 'the mapping of query requests' for the limitation 'mapping request'), where the mapping request includes a key for identifying the markup language document; and

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"mapping (See figure 3, page 60), in response to the mapping request, the data into the object model using mapping meta-data (see page 60, left-hand column, section "Heterogeneous model information sources": referring to "XML, and increasing popular format for information encoding and exchange, could be integrated by building relational wrappers over XML datasets by mapping XML Document type Definitions (DTD) into relational metadata") which defines how the data architecture of the markup language document maps to the object model" (See Figure 3, the left-hand rectangular box 'Mapping XML Document to Relation' associated with citation 'building relational wrappers over XML datasets by mapping XML Document type Definitions (DTD) into relational metadata' above shows how data from XML data file is laid out in the relational model context), *where the mapping step obtains the markup language document using the key.*

Rundensteiner does not explicitly disclose, *"using the key"* in the mapping.

Henninger discloses, *"using the key"* (Re: Henninger, see column 6, lines 49-67, and column 7, lines 1-26) in mapping an object model of a language into a structured database (Re: Henninger, see column 2, lines 55-65) for identifying data architecture of the mapping target (Re: Henninger, FIG. 2). Thus, the key causes data in the source mapped into the target correspondingly (re: Henninger, see FIG. 2, reference numeral 50), where Henninger suggests using the keys because the relationship between object model and relational structure is implicit, using the keys would help a developer to know the relation and thus he is easy to handle (Column 2, lines 4-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching *"using the key"* in Henninger to the teaching, mapping request, of Rundensteiner. The motivation is that doing so would help the developer to handle the relationship between two structures/models.

As per claim 3: Rundensteiner further discloses:

"The method as claimed in claim 1, wherein the markup language document has one or more elements (See figure 3, page 60, upper rectangular box: XML data file; and refer <address> for the limitation 'element') containing data (See Figure 3, in XML data file; refer 'Computer Science Dept' between tags <info> and </info> for 'data'), the object model has one or more object class (see figure 3,

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lower rectangular box: Relational model context. Refer 'Address' for 'object class'), *each object class has one or more attributes* (see Figure 3, in Relational model context, refer 'Id 1001' for 'attributes') *that correspond to the elements,*

and the step mapping includes a step of populating the attributes with the data of corresponding elements based on the mapping meta-data (see Figure 3, for example, data in XML data file <address> such as 'Computer Science Dept', is populated into the relational model context 'Address' based on XML Document Type Definitions an Relational Metadata).

As per claim 4: Rundensteiner further discloses:

"The method as claimed in claim 1, wherein the markup language document has one or more elements containing data, the object model has one or more object classes, each object class has one or more attributes that correspond to the elements and the step of mapping includes:

a step of generating a row structure corresponding to the markup language elements of the markup language document; (see Figure 3, page 60, the lower rectangular box, Relational model context, 'Address', is a row structure corresponding to the upper rectangular, XML data file. The Relational model context is built by 'Mapping XML');

a step of converting the row structure into one or more objects corresponding to the elements; (see Figure 3, for example, the Relation model context 'Address' is one of other relational model contexts; Figure 2, page 59 shows another Relational model context 'Schema': Salaries); *and*

a step of populating attributes of the converted objects with the data of the elements based on the mapping metadata" (see Figure 3, for example, the Relational model context contains Id with an attribute value 1001, and other data such as 'Computer Science Dept').

As per claim 5: Rundensteiner further discloses,

"The method as claimed in claim 3, wherein the markup language document further has at least one element (See figure 3, page 60, upper rectangular box: refer <address> for the limitation 'at least one element') containing one or more other elements (See figure 3, still refer <address> for the limitation 'one or more other elements') and the mapping step inserts, based on the mapping metadata, a value representing the relation between the at least one element and the one or more other elements into an

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attribute of the object model (See Figure 3, lower rectangular box: refer 'Id 1001' for 'an attribute of the object model') to represent a relationship between objects corresponding to the at least one element and the one or more other elements (The Id in this particular 'Relational model context' corresponds one attribute id, which is among one of other 'Addresses').

As per claim 6: Rundensteiner further discloses

"The method as claimed in claim 5, wherein the at least one element (Figure 3, page 60, upper rectangular box: refer <address> for the name of 'one element') contains a single element (Figure 3: within <Address> </Address> is a single element/or multiple elements depend on the structure of XML data file) containing data (Figure 3, For example <state> MA </state>) and the mapping step inserts a value (Figure 3, referring to '1001') representing the relation between the at least one element and the single element into an attribute (ID) of the object model that represents a one-to-one relationship (Relational Model Context: 'Address' is one-to-one relation to XML data file: <Address> 'element') between objects that correspond to the at least one element and the single element".

As per claim 7:

In regard to the limitations of claim 7,

Rundensteiner does not explicitly address limitations, *"one element contains a single element containing a pointer to another element"*, and *"an aggregate one-to-one relationship between objects that correspond to the at least one element and the single element"*.

Henninger teaches referencing elements and inheritance relations of elements, and from that it provides an aggregate one-to-one relationship between sources and mapped targets. That discloses *"one element contains a single element containing a pointer to another element"* (Re: Henninger, see column 6, lines 38-48, refer 'The inheritance between employee class and class person' for 'pointer'), and *"an aggregate one-to-one relationship between objects that correspond to the at least one element and the single element"* (Re: Henninger, see FIG. 3, reference numeral 50: for example, element '102' on-to-one to element '114'. Also see FIG. 5B, referring to '1-TO-1', shown from 'RELATIONSHIP' to 'UPDATE FOREIGN KEY ATTRIBUTE BASED ON TRANSFORM 50').

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Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further include the teaching of pointer (inheritance) and relations of object model in Henninger, that is for referencing elements and corresponding relationships of elements and for describing the corresponding architecture of the source and target into the teaching of Rundensteiner.

The motivation is that doing so would conform to the architectural relations between two models.

As per claim 8: In regard to the limitations of claim 8,

Rundensteiner does not explicitly address limitations, *"the multiple elements into attributes of the object model that represent one-to-many relationships between objects that correspond to the at least one element and the multiple elements"*.

Henninger teaches referencing elements and inheritance relations of elements, and from that it provides an aggregate one-to-many relationship of mapped targets. That discloses such limitations (Re: Henninger, see FIG 5B, refer '1-TO-MANY', shown from 'RELATIONSHIP' to 'MANY-SIDE' or 'ONE-SIDE').

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching of pointer (inheritance) and relations of object model in Henninger, that is for referencing elements and corresponding relationships of elements and for describing the corresponding architecture of the source and target into the teaching of Rundensteiner.

The motivation is that doing so would conform to the architectural relations between two models.

As per claim 9:

Rundensteiner does not explicitly address limitations, *"one element contains multiple elements containing pointer to another elements"*, and *"an aggregate one-to-many relationships between objects that correspond to the at least one element and the multiple element"*.

Henninger teaches referencing elements and inheritance relations of elements. and from that it provides an aggregate one-to-one relationship of mapped targets. That discloses *"one element contains multiple elements containing pointer to another elements"* (Re: Henninger, see column 6, lines 38-48, 'The inheritance between employee class and class person'), and *"an aggregate one-to-many relationships between objects that correspond to the at least one element and the multiple element"* (Re: Henninger,

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see FIG. 3, reference numeral 50: for example, element '108' is one-to-many to elements '119' and '120'. Also see FIG 5B, referring to '1-TO-MANY', shown from 'RELATIONSHIP' to 'MANY-SIDE' or 'ONE-SIDE').

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching of pointer (inheritance) and relations of object model in Henninger, that is for referencing elements and corresponding relationships of elements and for describing the corresponding architecture of the source and target into the teaching of Rundensteiner.

The motivation is that doing so would conform to the architectural relations between two models.
As per claim 10: Rundensteiner further discloses,

"The method as claimed in claim 1 further comprising a step of obtaining the mapping meta-data prior to the mapping step" (see page 60, left-hand column, section "Heterogeneous model information sources", referring to, mapping XML Document type Definitions (DTD) into relational metadata, this means that the mapping is performed after the existence of relational metadata).

As per claim 11: Rundensteiner further discloses,

"The method as claimed in claim 10, wherein the obtaining step is carried out during initialization of a system for executing the receiving step and the mapping step" (See page 57, see three bullets, 'At set up time...', 'During query processing time...', and 'During operation time,...'. This means that the maintaining data Warehouses includes initialization).

As per claim 12: Rundensteiner further discloses,

"The method as claimed in claim 1, wherein the markup language document has one or more elements, the object model has one or more object classes, and the mapping meta-data includes mapping information (Page 60, left-hand column, section "Heterogeneous model information sources", 'Relation metadata') *regarding one of the elements and the corresponding object class"* (See Figure 3, page 60, refer <address>, upper rectangular for 'one of the element', it is corresponding to 'Address', object class', in the lower rectangular box).

As per claim 13: Rundensteiner further discloses,

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"The method as claimed in claim 1, wherein the markup language document has one or more elements, the object model has one or more object classes, each object class has one or more attributes, the mapping meta-data includes mapping information regarding one of the elements that contains data and the corresponding attribute, and the mapping step maps the data of the one of the elements into the corresponding attributes based on the mapping information" (See Figure 3, page 60, for example <info> Computer Science Dept </info> 'the data of the one of the elements' is mapped into the element 'Address' which is corresponding to 'attributes' Id 1001, based on the Mapping XML Document Relation).

As per claim 14: Rundensteiner further discloses, *"The method as claimed in claim 1, wherein the markup language document is a document in which each element is defined by indicators"*

(See Figure 3, page 60, for example, the upper rectangular is an element 'Address' defined by <Address> and </Address>).

As per claim 15: Rundensteiner further discloses, *"The method as claimed in claim 14, wherein the markup language document is an eXtensible Markup Language (XML) document"* (See Figure 3, referring to "XML" data type file).

As per claim 16: In regard to claimed limitation of Claim 16, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 18: In regard to claimed limitation of Claim 18, the Claim has the limitation corresponding to the limitation of Claim 3. See rationale set forth in addressed to Claim 3 above.

As per claim 19: In regard to claimed limitation of Claim 19, the Claim has the limitation corresponding to the limitation of Claim 4. See rationale set forth in addressed to Claim 4 above.

As per claims 20-21: In regard to claimed limitations of Claims 20-21, the Claims have the limitations corresponding to the limitations of Claims 5-6. See rationale set forth in addressed to Claims 5-6 above.

As per claims 22-24: In regard to claimed limitations of Claims 22-24, the Claims have the limitations corresponding to the limitations of Claims 7-9. See rationale set forth in addressed to Claims 7-9 above.

As per claims 25-28: In regard to claimed limitations of Claims 25-28, the Claims have the limitations corresponding to the limitations of Claims 10-13. See rationale set forth in addressed to Claims 10-13 above.

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As per claims 29-30: In regard to claimed limitations of Claims 29-30, the Claims have the limitations corresponding to the limitations of Claims 14-15. See rationale set forth in addressed to Claims 14-15 above.

As per claim 31: In regard to claimed limitation of Claim 31, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 33: In regard to claimed limitation of Claim 33, the Claim has the limitation corresponding to the limitation of Claim 3. See rationale set forth in addressed to Claim 3 above.

As per claim 34: In regard to claimed limitation of Claim 34, the Claim has the limitation corresponding to the limitation of Claim 4. See rationale set forth in addressed to Claim 4 above.

As per claims 35-36: In regard to claimed limitations of Claims 35-36, the Claims have the limitations corresponding to the limitations of Claims 5-6. See rationale set forth in addressed to Claims 5-6 above.

As per claims 37-39: In regard to claimed limitations of Claims 37-39, the Claims have the limitations corresponding to the limitations of Claims 7-9. See rationale set forth in addressed to Claims 7-9 above.

As per claim 40: In regard to claimed limitation of Claim 40, the Claim has the limitation corresponding to the limitation of Claim 10. See rationale set forth in addressed to Claim 10 above.

As per claim 41: In regard to claimed limitation of Claim 41, the Claim has the limitation corresponding to the limitation of Claim 13. See rationale set forth in addressed to Claim 13 above.

As per claim 42: In regard to claimed limitation of Claim 42, the Claim has the limitation corresponding to the limitation of Claim 13. See rationale set forth in addressed to Claim 13 above.

As per claim 43: In regard to claimed limitation of Claim 43, the Claim has the limitation corresponding to the limitation of Claim 13. See rationale set forth in addressed to Claim 13 above.

As per claim 44: Rundensteiner further discloses:

"The manager in claim 31, wherein the object model has one or more classes (See Figure 3, page, lower rectangular box 'Address'. The Relational model context in Figure 3 is a particular one among the Relational Models. See page 59, Figure 2, 'Salaries', another relational Schema/Relational model context), each object class has one or more attributes (Figure 3, lower rectangular box, referring to 'ID

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1001'), *and the mapping executor includes a mapping unit* (Figure 3, for example, the right-hand square box, 'Dump Relations') *for creating one or more elements* (Figure 3, for example, the upper rectangular box, <Address> 'element') *corresponding to the attributes ('ID') by inserting values of the attributes* (Figure 3, for example, the lower rectangular box, value '1001') *based on the mapping meta-data* (Figure 3, left-hand rectangular box, 'Mapping XML', right-hand square box, 'Dump Relations').

As per claims 45-46: In regard to claimed limitations of Claims 45-46, the Claims have the limitations corresponding to the limitations of Claims 14-15. See rationale set forth in addressed to Claims 14-15 above.

As per claim 47: In regard to claimed limitation of Claim 47, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 48: Rundensteiner further discloses claim 48: See Figure 1 (page 58), wherein the rectangular box, "Middleware" and "Metaknowledge" describe 'a storage'.

As per claim 49: In regard to claimed limitation of Claim 49, the Claim has the limitation corresponding to the limitation of Claim 14. See rationale set forth in addressed to Claim 14 above.

As per claim 50: In regard to claimed limitation of Claim 50, the Claim has the limitation corresponding to the limitation of Claim 11. See rationale set forth in addressed to Claim 11 above.

As per claim 51: Rundensteiner further discloses claim 51: See three bullets in page 57, teach run-time.

As per claim 52: In regard to claimed limitation of Claim 52, the Claim has the limitation corresponding to the limitation of Claim 3. See rationale set forth in addressed to Claim 3 above.

As per claim 53: Rundensteiner further discloses claim 51: *"where the object model has one or more object classes, each object class has one or more attributes* (See Figure 3, page 60, lower rectangular box "ID"), *and the mapping executor includes a mapping unit* (Figure 3, left-hand rectangular box or right-hand square box) *for creating one or more elements* (Figure 3, upper rectangular box, <address>) *corresponding to the attributes by inserting values of the attributes* (Figure 3, lower rectangular box, ID 1001) *based on the mapping meta-data"* (See Figure 3, page 60, for example 'ID 1001' corresponding to the element <address> where the values is indicated to the particular element, for example, the element <Address> shown in the upper rectangular based on the Mapping XML Document or Dump Relations).

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As per claims 54-55: In regard to claimed limitations of Claims 54-55, the Claims have the limitations corresponding to the limitations of Claims 14-15. See rationale set forth in addressed to Claims 14-15 above.

As per claim 56: In regard to claimed limitation of Claim 56, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 57: In regard to claimed limitation of Claim 57, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 58:

The claim recites a computer program product for use. However, the claim functionality is corresponding to the steps recited in Claim 1. The rejection of claim 56 is in the same reason as set forth in connecting to the rejection of claim 1.

As per claim 59: In regard to claimed limitation of Claim 59, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 60: In regard to claimed limitation of Claim 60, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

As per claim 61: In regard to claimed limitation of Claim 61, the Claim has the limitation corresponding to the limitation of Claim 1. See rationale set forth in addressed to Claim 1 above.

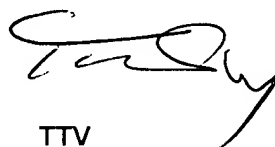
Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be reached on 8:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3694. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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TTV

Patent Examiner
Art Unit: 2122
March 4, 2005